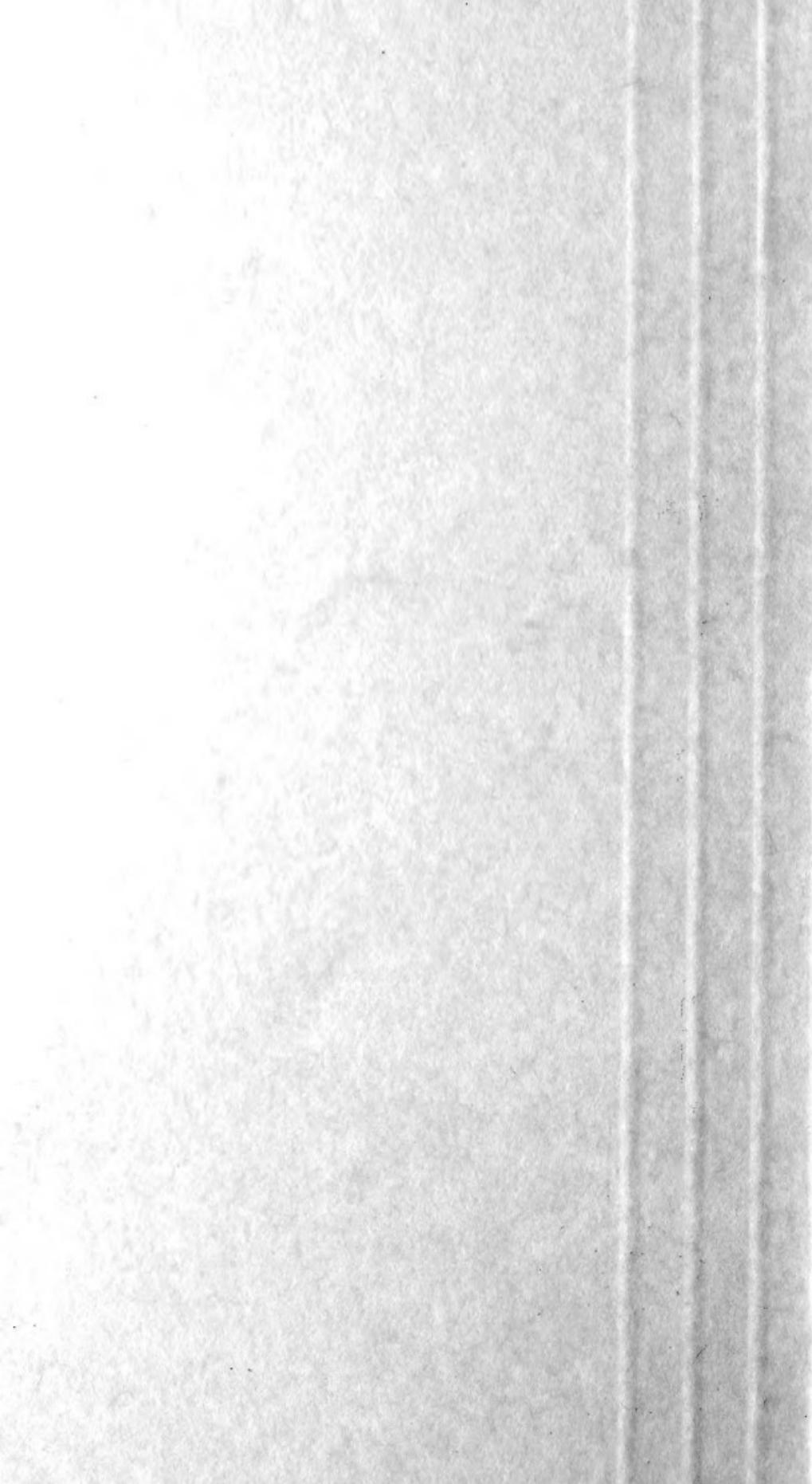


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Dr. Andrews

# THE PLANTING AND CARE OF TREES FOR COLORADO



D. M. ANDREWS  
Boulder, Colo.

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**D. M. ANDREWS, Owner**  
**Boulder, Colorado**

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**D. M. ANDREWS, Boulder, Colo.**

# THE PLANTING AND CARE OF TREES<sup>°</sup>

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## PLANTING A TREE

HE miracle of tree planting to me is this: that you can dig up a tree, ship it by rail 100 miles or 1,000 miles, plant it out again and it will live and grow almost as if nothing had happened. True, a few precautions must be observed, but otherwise the results are remarkably certain. Although I have been familiar with the process of planting since childhood, the miracle impresses me more and more each springtime.

To the experienced planter the process of planting a tree is very simple. In the nursery where many thousands are planted in a single season it becomes a matter of routine. Like many superstitions which vanish under the light of facts, the mystery of tree planting disappears as soon as the individual grasps a few fundamental principles. There is no such thing as luck with trees or flowers or poultry; neither does genius play a very important part.

Now, I propose to take up the matter of tree planting very plainly and I trust the reader will pardon me for supposing all through these pages, that he or she knows nothing

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about trees whatever, and that planting is a lost art.

First, I will explain how we plant a tree in the nursery, which is really the simplest form of planting. We will suppose that the soil has been prepared by deep plowing and is fine and mellow, not sticky, but moist enough to pack slightly if squeezed in the hand. The row is opened for planting by plowing a deep furrow, throwing the earth both ways. The bottom of the furrow is full of mellow soil and there is plenty on each side for covering. The trees are heeled in near by, or have been well sprinkled and covered closely from the sun and dry air with wet canvas. Usually three men plant, one carrying a bundle of trees, the other two using shovels. Enough earth is lifted from the bottom of the trench to let the tree stand an inch or two deeper than it grew before, and allow the roots to spread naturally without crowding. The one carrying the trees holds a tree in place, perfectly upright and in line with those already planted. The two with shovels at each side of the row, fill carefully with fine soil while the one holding, rocks the tree gently to cause the earth to settle down among the roots. Then before the filling is completed, he packs the soil very firmly, using his heels with the full weight of his body, so that all the soil loosened is again made very firm about the roots. This repacking of the earth insures that every root fiber is again in contact with moist, mellow but firm soil which restores

capillarity and is the essential feature of good planting everywhere, but especially in a dry climate. The tree should now stand firmly and perfectly erect; the surface is leveled and left loose to act as a mulch for conserving moisture. This completes the planting of the tree.

The essentials which apply alike to all planting, whether it be a tree or shrub, flower or vine, may be summarized in a few words. A tree or plant, moist mellow soil excavated sufficiently to allow a full spread of roots at the proper depth, careful filling to avoid air spaces, repacking very firmly to restore capillarity, with a mulch of mellow soil at the surface. This application of "dry farming" was in use by nurserymen many years before it was exploited for Colorado farmers.

If trees are to be planted where preparation of the soil is necessary, the excavation should be made, the soil prepared and thrown back into the hole and thoroughly watered a week or several weeks before the time for planting. If practicable, this should be done in autumn for spring planting and nature will assist greatly in mellowing the soil. The actual operation of planting then becomes as simple as planting in the nursery, can be quickly done, and the tree has the best possible chance for its life.

It is a common practice to dig holes for trees a long time before planting, leaving the pile of earth to dry out and bake for days or weeks. Nothing could be much worse for the

prospects of the tree, with no mellow soil in which to embed the roots. Often the hole is too deep or too shallow, and in either case the tree is thrust to the bottom of the hole without reference to its former position and the earth tumbled in. A little basin is left where water is applied in the more or less near future. This may not be sufficient to reach the roots, or it may be enough with frequent repetitions to actually drown the tree. Perhaps it is superfluous to say that this is "how not to plant a tree," yet thousands of good trees are lost annually from planting operations not much better than I have described.

## SOIL FOR TREES

Trees have a remarkable ability to adapt themselves to different soils. Only a few kinds are very sensitive to soil conditions, and these exceptions pertain more frequently to moisture and mechanical texture than to soil elements. Any good fertile loam is suitable for trees. Most kinds will grow more rapidly in a sandy loam than in a heavy clay, but the life of the tree presumably is shortened in proportion to the rapidity of growth. As a rule, most quick growing trees are short lived.

Trees respond to good soil and culture with just as much certainty as do garden vegetables, but the period of development covers years instead of weeks and we are apt to lose sight of the fact.

When trees are to be planted in a stony or sterile place, an excavation should be made

rather larger than the spread of roots, and good soil exchanged for that which is removed. If merely stony, it may only be necessary to add enough to take the place of the stones.

The application of manure to the soil in which trees are to be planted may result in more harm than good, except when wisely used. Fresh horse manure must not come in contact with the roots, as it is too heating. Very old manure, preferably cow manure, may be mixed with the soil in proportion of one part to six or eight of soil. If fresh manure of any sort is to be used, it should be well spaded with the soil in the bottom of the excavation, but below the tree roots when planted. A little can be mixed with the top soil after the roots have been covered.

## PLANTING WITH DYNAMITE

If an excavation made in hard-pan be filled with good soil and a tree planted therein, it frequently occurs that the tree will thrive for a few years and then take on a half starved appearance. What has happened? The basin filled with good soil acts as a flower-pot, the soil has become exhausted and the roots cannot reach enough fertility in the surrounding soil to supply the ever increasing needs of the tree. If the hard-pan could be broken up to a great depth and breadth the tree would readily extend its roots and again thrive.

This illustrates the principle of the somewhat modern method of planting with dynamite. A small charge of low percent dyna-

mite is exploded where the tree is to stand, at a depth of eighteen to twenty-four inches for small trees. This shatters the subsoil and may make a sufficient opening for planting; at least but little shoveling will be required if the "shooting" has been properly done. Any damage from flying rocks or earth may be avoided by a net of several folds of heavy woven wire fencing, held down by two or three heavy posts laid across the netting. This is not necessary except near buildings. It is likely that one must secure a permit from the proper authorities before using dynamite on the city streets. It is not likely that much benefit will be derived from using an explosive in deep mellow soil, nor where the subsoil is of a pasty character, but the crumbling or shattering effect on hard soils is certainly beneficial and unobtainable otherwise except by extensive digging.

Before attempting to make use of this somewhat dangerous process of soil treatment, a thorough study should be made of the booklets furnished by the manufacturers of explosives. These booklets can be obtained through the local dealer.

## SELECTING THE STOCK

I have advised careful planting and good soil and have explained briefly how to secure these, but of no less importance is the procuring of suitable stock, without which disappointment must inevitably result.

Necessity formerly compelled planters to

seek for their young trees in the forest or along river banks, but this source now is of diminishing importance.

The nursery industry throughout the country has assumed large proportions, and engages men of more than ordinary ability, because, no other branch of agriculture demands such a rare blending of judgement, patience, application and foresight, combined with practical business ability and honesty. I have included honesty because in more than twenty years acquaintance and dealing with nurserymen, I have found strict honesty to predominate, and honesty must be included if the nurseryman is to be permanently successful.

You can buy direct from the nurseryman by catalogue or by personal selection, or from an agent or salesman. Personal selection has certain advantages but the visit should be so timed that it will not occur during the digging and shipping season, when it is scarcely possible for the nurseryman to give more than the briefest attention. The summer growing season is the best time of all, both for the nurseryman and visitor, and a visit at any time during the summer is instructive and affords the best possible occasion for the selection and reservation of stock for future planting.

The catalogue gives opportunity for careful deliberation on the part of the customer, and with accurate descriptions and illustrations the selection of suitable stock is made comparatively easy and safe. Catalogue buy-

ing will prove more satisfactory in the long run than a hasty purchase unduly influenced by a smooth talking agent or salesman. Buying through a catalogue is altogether the best economy, because the cost of selling is reduced to the minimum and the corresponding reduction in price becomes one of the leading inducements to the customer.

Because a nurseryman's service is to a degree professional, considerable dependence must be placed upon his honesty, reliability and experience. His reputation in his own community is usually a safe guide, and may be made the subject of inquiry through one's banker.

The time of planting should be anticipated by placing your order early. The season for delivery is of necessity brief, and the nurseryman and his helpers work at high pressure and for long hours. Orders which arrive late cannot fairly take precedence over those which came in earlier, and consequent delays are not always avoidable. Early orders will result in better service.

## GUARANTEEING NURSERY STOCK

Although this is strictly outside of my subject, it is one of the first questions to arise in a transaction for the purchase of nursery stock.

This question has sorely vexed the nurserymen, has wrought disappointment to the purchaser when an easy talking salesman has failed to show up to redeem his promise; and

misunderstandings on this account have resulted in lost customers, lack of confidence and an increasing impression that what could be replaced free or at half price had really but little intrinsic value.

Usually the nurseryman's heart sinks clear down to his shoetops when he hears the question, "Do you guarantee these to live?" A guaranty implies an insurance, and insurance in turn implies a premium to be paid by the insured. It will be in the bill, though you may not see it. Where the guaranty policy is effective, the careful planter pays for the losses of the careless ones.

The whole question revolves on this point: if good stock has been delivered as ordered, there is no valid reason why the nurseryman should replace failures as a matter of obligation. On the other hand, if through error, oversight or intention he has delivered inferior stock, why should the purchaser be asked to pay half price or any price to get it replaced?

## IRRIGATION AND DRAINAGE

Trees or other plants properly planted in moist, mellow soil will not require water when planted, nor for several days, and if cool weather prevails, they may even be left for two or three weeks. This will read like heresy to many who have been accustomed to leaving newly planted trees standing in a pool of mud. Recently set trees cannot assimilate large quantities of water, and when the soil is kept saturated for a long time to the extent

that air is excluded, the tree will die from strangulation.

There is, however, another condition to guard against. Daily sprinkling of the surface is not sure to reach the roots, and by inducing capillary action may even exhaust the moisture from the lower soil, pumping it to the surface where it is lost by evaporation. One of the principles of "dry farming" is to keep at all times a surface mulch of fine, dry earth, stirring it after every rain, so that capillary action will be interrupted. Remember, that daily sprinkling may result in a constantly muddy surface while the roots are perishing from drought.

Frequency of irrigation and the amount to be applied at one time cannot be determined by any general rule, so much depends upon the texture of the soil, drainage, seasonal temperatures and various local conditions. About the only general instructions which always apply, are to withhold water until the need is indicated, and then give a sufficient amount to thoroughly wet the soil wherever the roots extend. Sandy soils which drain freely must be irrigated more frequently and more copiously than clay soils. If water stands, as on low lands, within a few feet of the surface, frequent cultivation may greatly diminish the necessity for and frequency of irrigation. Do not make the mistake of trying to let irrigation take the place of cultivation.

When the tree is planted in the lawn, the sod should not be allowed to encroach upon the

excavated space before the second season, and this area should be kept fine and mellow. To assist in watering this soil may be scooped away from the tree to form a basin, but after the water has settled away the surface should again be leveled. This affords the best possible mulch to reduce loss of moisture from evaporation. A mulch of manure, straw or lawn clippings is sometimes advised, but this may force the fine feeding roots too near the surface where they will subsequently be injured or destroyed when the mulch is removed.

Drainage need not often be resorted to, but in some instances it is essential. Only a very few trees can thrive with "wet feet," and these are not the kinds we like to plant about our homes. The seepage resulting from the irrigation of higher land often causes the water level on the low lands to rise so near the surface that strangulation results even with large trees. The foliage of the Soft Maple, which is unusually sensitive, sometimes becomes yellowish in summer from this cause. Seepage frequently brings alkali to the surface which is very destructive to vegetation. Few trees can successfully resist the effects of much alkali. Tile drainage, by removing the cause, may correct the difficulty.

## PRUNING SHADE TREES

When planting a tree, examine the roots and remove bruised portions with a smooth cut, which will heal quicker than a jagged surface.

To reestablish a proper balance, the removal of part of the top, corresponding to the loss to the root system, is always advisable and indeed is a necessity with the hard wood trees, like Oak, Black Walnut, Sugar Maple, Ash, etc. The method of pruning the young tree depends upon the kind and also upon the root. Where there is an abundance of fibrous roots, less pruning is necessary. Any tree which naturally forms a strong central axis or leader should not have the top cut off. The lateral branches may be shortened, cutting just beyond a bud, or some may be removed altogether by a smooth cut close to, and parallel with the surface of the trunk, never leaving a projecting stub. The shortened branches left to form the head should stand in different directions and should be spaced far enough to prevent final crowding of the branches. Avoid forming the head with a fork of two or more equally strong branches.

The point to be constantly borne in mind in pruning shade trees, is to preserve the character and natural shape of the tree, and to avoid the artificial shaping the tree; otherwise, what is the use of planting different kinds if not permitted to develop their own particular types of beauty? The art of pruning consists in making the finished tree look as if no branches had been removed.

To restore symmetry, branches may be thinned from the heavy side, or be cut back to some fork within the outlines of the tree,

but any extensive trimming of the ends of branches which suggests shearing is a travesty on the art of pruning so far as its application to shade trees is concerned. Under this head comes the pollarding of trees, which consists in cutting off all the top and large branches. The new growth is easily broken down by snow and wind and decay soon weakens the trunk. It is doubtless better in most instances to remove the tree entirely when it becomes too large.

Nearly all the bother of pruning shade trees can be eliminated for all time, by planting kinds of moderate growth, and which naturally assume symmetrical proportions, always allowing room for final development without crowding.

### The Right Tree for the Place

When we would build a house, we consult an architect; when we are ill, we see a physician; if we become involved in legal difficulties, we seek counsel from one versed in the law; but when we plant trees, if we may judge by the haphazard results all about us, we must conclude that the dominating idea is to combine cheapness with something that will grow quickly. The American people are a nation of specialists, but they have not until recently recognized the tree specialist.

It does not require a long line of arguments to show the error of the short sighted policy of thoughtless planting, but it does take more than superficial observation for one to

comprehend fully the vast loss which has resulted to the people of Colorado from the planting of so many quick growing and short lived trees during the past fifty years.

If good trees, like the Honey Locust, Red Oak, and other Oaks, Norway Maple, Sugar Maple, Black Walnut, American and European Lindens, Kentucky Coffee Tree, Hardy Catalpa, Horse Chestnut, Black Locust, White Ash, and the American and various European Elms, had been planted, not one would be failing from old age; many would be in the prime of life, good for another fifty years; others would still thrive for a century or two. I do not mean to infer that our planting should be restricted to these kinds alone, but think what every town and city of Colorado would be like if we had these trees.

What do we find instead? We find that more than nine-tenths of all the shade trees planted in the state are among six kinds: Cottonwoods, Carolina Poplar, Soft Maple, Box Elder, White Willow and Green Ash. Of these, the last named is the only one which is not showing a marked decline in many instances from old age.

Let me emphasize now a suggestion, which if carried out, will mark a step in tree planting that will do more toward making "Colorado the Place to Live" than any other movement. It is this: Never replace any one of the five trees mentioned, excluding the Green Ash, with one of either of these kinds. Let us not repeat the mistake, and delay progress for another fifty years.

The value of rapid growth is generally overestimated. It becomes distinctly a disadvantage in very many instances. The crowding of trees to obtain quick shade is along the same line, and is invariably detrimental.

With a diversity of soil and a still greater diversity of climate, governed by differences of altitude and other physiographic conditions, the problem of the right tree for the place becomes to a considerable extent, an individual problem, whose correct solution depends upon a study of each particular situation, combined with an extensive knowledge of the different trees. General rules can be formulated and trees can be arranged in groups, illustrating special use, to assist greatly in the majority of cases. Where the planting contemplated is of much magnitude, or the situation very complicated, the wide experience of the tree specialist will enable him to determine results with accuracy, and consequently save disappointment and unnecessary outlay.

## GENERAL REMARKS

There are a few other points which may detract from the fullest success and our enjoyment of trees which I would not intentionally overlook, as my aim throughout all these pages has been to eliminate difficulties and make success in tree growing so easy and certain that failures of any sort hereafter shall be exceedingly rare.

This brings us to insect pests and diseases. Here again the selection of good kinds helps

us to do away with most of the trouble from this source, as some trees are almost invariably healthy and free from insects. The fourteen trees named in the last chapter are generally safe in these respects. Others we know, like the Box Elder, are seldom free from insects, and while plant diseases are less likely to prevail in a dry climate than elsewhere, it is well to be on the safe side.

Other trees have bad habits, as persistent sprouting from the root, and should be avoided.

Wind and snow break certain trees much more than others. Wind also causes certain trees to lean to the eastward, while other kinds are always symmetrical. Without taking up the entire list of trees individually, which space will not permit, it is impossible to more than suggest what every reader may discover by patient observation.

## CLASSIFIED LIST OF TREES

The following classification of trees aims to be merely suggestive and must not be followed too literally, because some trees mentioned are inferior to others under certain conditions, and trees not mentioned have value and even superiority. To make the classification somewhat more comprehensive I have made use of sixteen letters of the alphabet, four letters in parenthesis following each name, to designate size at maturity, rapidity of growth, spread of branches and hardiness.

Even these characters are relative, depending upon local conditions.

Size—A, large; B, medium; C, small.

Growth—E, rapid; F, medium; G, slow.

Spread—L, broad; M, medium; N. narrow.

Hardiness—S, very hardy; T, hardy; W, hardy in sheltered locations.

Thus, after Acer, Norway Maple (AFLS) would read, "Tree of large size, medium growth, broad spread of branches and very hardy."

### Trees for Streets and Avenues

Acer, Norway Maple (AFLS)

Acer, Sugar Maple (AFMS)

Acer, Wier's Cut-leaved (AEMT)

Betula, Canoe Birch (BFMT)

Celtis, Hackberry (BFMS)

Fraxinus, White Ash (AFMS)

Fraxinus, Green Ash (AFMS)

Gleditsia, Honey Locust (AEAMS)

Gymnocladus, Ky. Coffee (MGNS)

Populus, Lance-leaved C. (AEMS)

Populus, Lombardy Poplar (AENS)

Populus, Cottonwood (AELS)

Quercus, White Oak (AGLS)

Quercus, Burr Oak (AFLS)

Quercus, Pin Oak (AGMS)

Quercus, Red Oak (AFMS)

Robinia, Black Locust (BFMS)

Tilia, American Linden (AEMS)

Tilia, European Linden (BFMS)

Ulmus, American Elm (AELS)

*Ulmus*, English Elm (AEMT)  
*Ulmus*, Scotch Elm (AEMT)

### Flowering Trees

*Acer*, Red Maple (BGMS)  
*Aesculus*, Horse Chestnut (BFMT)  
*Cercis*, Red Bud or Judas (CGMW)  
*Crataegus*, Hawthorn, various (CFMS)  
*Malus*, Flowering Crab, various (CFMS)  
*Prunus*, Cherry; Plum, various  
*Robinia*, Black Locust (BFMS)  
*Robinia*, Pink Locust (CFMS)  
*Sorbus*, Mountain Ash (BFMS)  
*Syringa*, Tree Lilac (CGMT)  
*Tilia*, Linden, various.

### Trees With Cut or Divided Foliage

*Acer*, Siberian Maple (CGMS)  
*Acer*, Wier's Cut-Leaved (AEMT)  
*Aesculus*, Horse Chestnut (BFMT)  
*Betula*, Weeping Birch (BFMT)  
*Gleditsia*, Honey Locust (AEMS)  
*Gymnocladus*, Coffee Tree (BGNS)  
*Quercus*, Oaks, various  
*Robinia*, Flowering Locusts  
*Sorbus*, Mountain Ash, various

### Notable for Bark, Foliage or Fruit

*Acer*, Schwedler's Maple (foliage)  
*Betula*, Birch, various (bark)  
*Crataegus*, Hawthorn (fruit)  
*Elaeagnus*, Russian Olive (bark, foliage)  
*Gleditsia*, Honey Locust (pods)  
*Populus*, Bolle's Poplar (bark, foliage)  
*Salix*, Willow, various (bark, foliage)  
*Sorbus*, Mountain Ash (fruit)

### Low Trees of Bushy Habit

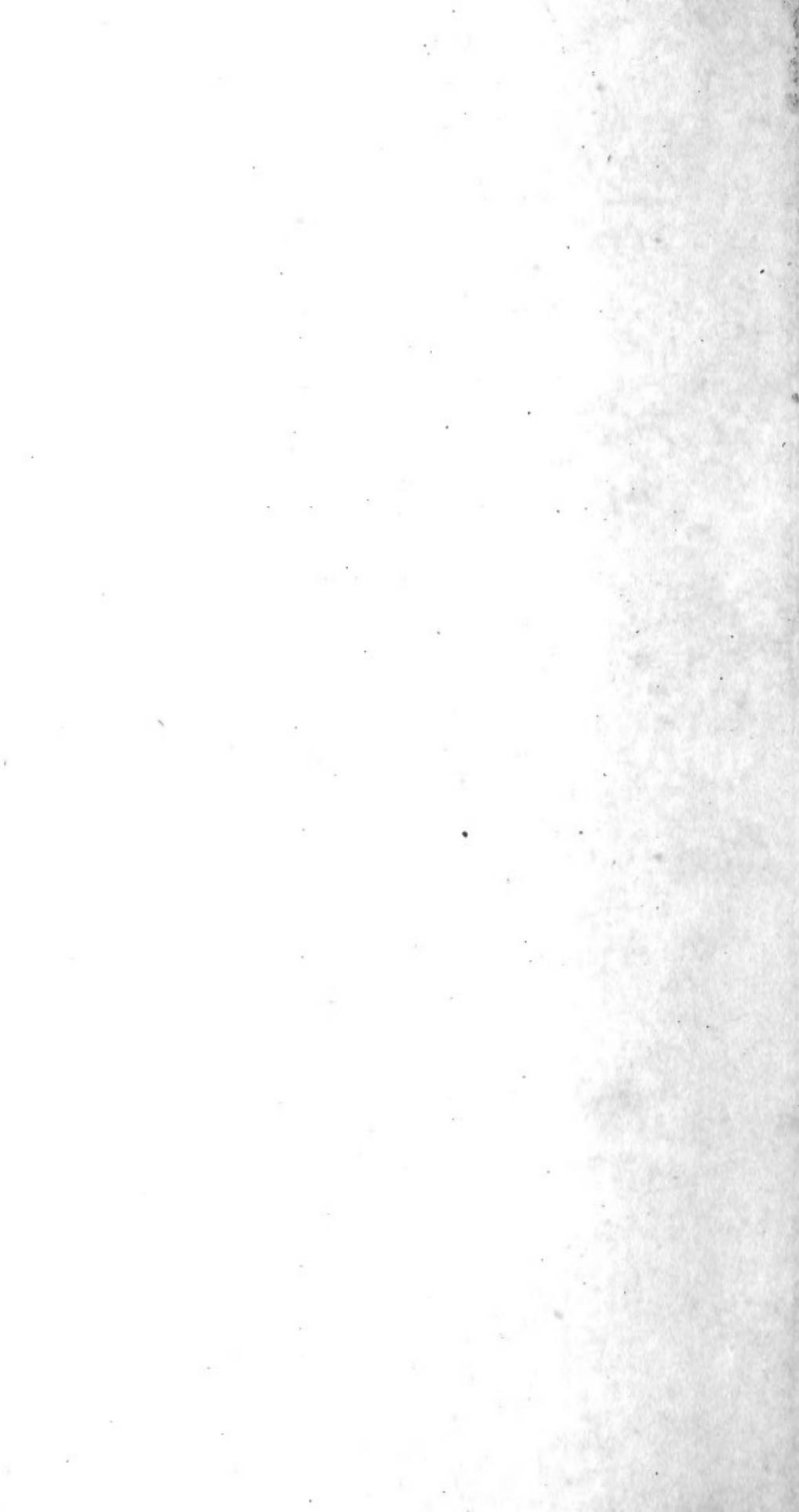
- Acer, Siberian Maple (CGMS)
- Alnus, Alder, (CFMS)
- Betula, Rocky Mountain Birch (CFMS)
- Celtis, Western Hackberry (BFLS)
- Crataegus, Hawthorn, various
- Elaeagnus, Russian Olive (BELS)
- Malus, Flowering Crabs (CFMS)
- Morus, Russian Mulberry (BFMS)
- Prunus, American Plum (CFLS)
- Prunus, Bird Cherry (CFMS)
- Robinia, Pink Locust (CFMS)

### Weeping or Drooping Trees

- Acer, Wier's Cut-leaved Maple (AEMT)
- Betula, Cut-Leaved Birch (BFMT)
- Salix, Niobe Willow (AEMS)
- Salix, Kilmarnock (CGNW)
- Sorbus, Weeping Mountain Ash (CGMT)
- Ulmus, Camperdown Elm (CGLT)

### Trees Very Resistant to Wind

- Celtis, Hackberry
- Gleditsia, Honey Locust
- Gymnocladus, Kentucky Coffee Tree
- Populus, Lance-leaved Cottonwood
- Quercus, Red Oak, Pin Oak
- Robinia, Flowering Locusts





**BOULDER NEWS PRESS**  
Boulder, Colo.